



# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

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### Memorandum

To: National Fish Hatchery Managers, Pacific and Pacific Southwest Regions

From: Ronald Twibell, Fish Nutritionist, Abernathy FTC

Subject: Fish Feed Quality Control Report for the first quarter of FY2015

During the first quarter of FY2015 the Applied Nutrition Program at Abernathy Fish Technology Center (AFTC) analyzed the moisture and ash concentrations of 16 diets as part of the Pacific and Pacific Southwest Region's Fish Feed Quality Control Program. This included 15 diet samples from 14 Pacific and Pacific Southwest Regions' National Fish Hatcheries (NFHs) and 1 diet sample from AFTC (Table 1). Samples of feed from each hatchery also were sent to Eurofins Inc. for protein, lipid and rancidity analyses. Rancidity analysis includes the measurement of peroxide value and free fatty acids.

Proximate analysis results are presented in Table 2. Analyzed protein concentrations in two samples (Hagerman Diet 2.4 mm from Dworshak NFH and Bio Vita Fry 2.0 mm from Entiat NFH) and analyzed lipid concentrations in two samples (Bio Vita Starter # 0 from Leavenworth NFH and Bio Vita Starter # 1 from Spring Creek NFH ) were below the manufacturers' minimum specifications. Also, the analyzed moisture concentration of the 2.4 mm Hagerman Diet from Dworshak NFH exceeded the manufacturer's maximum specification. However, each of these values was within the limits of analytical variation.

Results of rancidity analyses indicated the free fatty acid levels in most samples were at or above the fresh oil level of 3% (Table 2). The analyzed free fatty acid values ranged from 2.6-5.3% and were within the typical range we have seen. The analyzed peroxide values ranged from <2 to 8.5 meq/kg oil (Table 2) and also were within the typical range of values we have seen. Fresh oils should have free fatty acid levels at or below 3% and a peroxide value in the range of 3-10 meq/kg oil.

Table 1. Description of fish feeds received at Abernathy FTC during the first quarter of FY2015.

Facility	Date Sample	Manufacturer	Manufacturing	Sample Description
	Received at AFTC		Date	
Abernathy FTC	10/31/14	Bio Oregon	06/25/14	Bio Vita Fry 1.5 mm, lot 629082
Coleman NFH	12/19/14	Bio Oregon	11/14/14	Bio Clark's Fry 2.5 mm, lot 630743
Dworshak NFH	10/23/14	Rangen	09/11/14	Hagerman Diet 2.4 mm, lot 5217
Eagle Creek NFH	11/17/14	Bio Oregon	09/20/14	Bio Clark's Fry 2.0 mm, lot 630218
Entiat NFH	12/15/14	Bio Oregon	09/03/14	Bio Pro 2.0 mm, lot 630229
Entiat NFH	12/15/14	Bio Oregon	06/24/14	Bio Vita Fry 2.0 mm, lot 629074
Hagerman NFH	10/23/14	Skretting, USA	not provided	Hagerman Diet 2x vit., 2.5 mm, lot 3625803
Lahontan NFH	10/22/14	Skretting, USA	08/22/14	Oncor Fry sinking 2.0 mm, lot 3624972
Leavenworth NFH	12/18/14	Bio Oregon	10/29/14	Bio Vita Starter #0, lot 630563
Little White Salmon NFH	09/12/14	Bio Oregon	08/20/14	Bio Clark's Fry 2.0 mm, lot 629768
Makah NFH	11/03/14	Bio Oregon	10/16/14	BioOlympic 2.5 mm, lot 630399
Quilcene NFH	12/29/14	Bio Oregon	11/12/14	Bio Vita Starter #0, lot 630631
Quinalt NFH	12/17/14	Bio Oregon	10/01/14	Bio Pro 2.5 mm, lot 630245
Spring Creek NFH	12/15/14	Bio Oregon	10/20/14	Bio Vita Starter #1, lot 630469
Warm Springs NFH	10/24/14	Bio Oregon	07/06/14	Bio Pro 1.5 mm, lot 629276

Table 1 continued

Willard NFH	11/06/14	Bio Oregon	09/28/14	Bio Clark's Fry 2.0 mm, lot 630218
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Table 2. Results of proximate composition and rancidity analysis of commercial fish feeds sampled during the first quarter of FY2015.

Facility	Diet	Analyzed Proximate Composition				Manufacturers' Specifications <sup>1</sup>				Rancidity	
		Protein	Lipid	Ash	Moisture	Protein	Lipid	Ash	Moisture	Peroxide value	Free fatty acids
			%				%			meq/kg oil	%
Abernathy FTC	Bio Vita Fry 1.5 mm	51.1	23.9	8.7	7.4	50.0	22.0	13.0	8.5	6.2	4.0
Coleman NFH	Bio Clark's Fry 2.5 mm	49.3	20.6	7.4	6.9	47.0	18.0	9.0	8.5	5.2	3.6
Dworshak NFH	Hagerman Diet 2.4 mm	44.1	15.7	9.0	10.2	45.0	14.0	15.0	≤10.0	4.3	5.3
Eagle Creek NFH	Bio Clark's Fry 2.0 mm	49.7	18.7	7.0	8.0	47.0	18.0	9.0	8.5	3.9	3.9
Entiat NFH	Bio Pro 2.0 mm	51.1	22.7	10.1	8.2	50.0	22.0	13.0	8.5	4.7	3.7
Entiat NFH	Bio Vita Fry 2.0 mm	49.6	24.7	9.2	8.2	50.0	22.0	13.0	8.5	3.7	4.4
Hagerman NFH	Hagerman Diet 2X vit.	48.9	14.7	9.5	5.5	45.0	14.0	15.0	10.0	4.9	3.5
Lahontan NFH	Oncor Fry sink. 2.0 mm	48.9	19.8	8.0	6.7	46.0	18.0	12.0	9.0	8.5	3.8
Leavenworth NFH <sup>2</sup>	Bio Vita Starter #0	55.5	17.6	8.9	7.2	53.0	18.0	12.0	8.5	7.3	4.7
Little White S. NFH	Bio Clark's Fry 2.0 mm	48.3	21.8	7.0	7.8	47.0	18.0	9.0	8.5	<2.0	4.4
Makah NFH	BioOlympic 2.5 mm	53.2	22.0	10.8	6.5	50.0	20.0	13.0	8.5	3.3	4.4
Quilcene NFH	Bio Vita Starter #0	55.3	19.4	9.3	6.3	53.0	18.0	12.0	8.5	4.3	2.6
Quinault NFH	Bio Pro 2.5 mm	50.9	22.2	9.9	8.0	50.0	22.0	13.0	8.5	5.0	3.4

Table 2 continued

Spring Creek NFH	Bio Vita Starter #1	57.1	19.3	8.7	5.7	52.0	20.0	12.0	8.5	7.8	4.2
Warm Springs NFH	Bio Pro 1.5 mm	50.7	23.8	8.9	7.5	50.0	22.0	13.0	8.5	3.7	3.3
Willard NFH	Bio Clark's Fry 2.0 mm	49.7	19.0	7.1	7.4	47.0	18.0	9.0	8.5	4.6	4.0

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<sup>1</sup>Unless noted otherwise protein and lipid specifications are minimum values, and ash and moisture specifications are maximum values.

<sup>2</sup>Analyzed phosphorus (P) concentration was 1.6 %. According to the feed composition tag, the manufacturer's minimum P specification is 1.2 %